



US005126007A

United States Patent [19][11] **Patent Number:** 5,126,007**Shmulovich**[45] **Date of Patent:** Jun. 30, 1992[54] **METHOD FOR ETCHING A PATTERN IN LAYER OF GOLD****FOREIGN PATENT DOCUMENTS**

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Attorney, Agent, or Firm—Glen E. Books[73] **Assignee:** AT&T Bell Laboratories, Murray Hill, N.J.[57] **ABSTRACT**[21] **Appl. No.:** 614,785[22] **Filed:** Nov. 16, 1990[51] **Int. Cl.⁵** H01L 21/00[52] **U.S. Cl.** 156/643; 156/646;
156/664; 156/659.1[58] **Field of Search** 156/643, 646, 664, 659.1[56] **References Cited****U.S. PATENT DOCUMENTS**

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The present applicant has discovered that gold can be patterned by masking and reactively ion etching in a CF_4/O_2 plasma. In accordance with the invention, a layer of gold is patterned by the steps of a) forming a layer of gold on a substrate, b) masking the gold layer to selectively expose a pattern to be etched, c) exposing the masked layer to a CF_4/O_2 plasma. In preferred practice, the substrate comprises a gallium arsenide substrate having an interface layer comprising titanium to promote adhesion of the gold layer, and the gold layer is formed by sputtering onto the interface layer. The gold layer is masked by photoresist, and the masked layer is exposed to a CF_4/O_2 plasma with the molar percent of O_2 in excess of about 8%. Advantageously, the exposed intermediate layer can be plasma etched away.

8 Claims, 1 Drawing Sheet